Defense Information Systems Agency

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C2 Way Ahead: Joint C2 Objective Architecture

15 August 2011

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Joint C2 Objective Architecture

- **The Joint Command and Control (C2) Objective Architecture (Joint C2 OA)**
  - **technical concepts and constructs to guide C2 development toward satisfaction of DoD Information Enterprise Architecture (IEA) goals, principles, rules**
  - **applicable to the development of Joint C2 capabilities and to existing capabilities that are proposed for adoption or adaptation to become part of the Joint C2 family of capabilities**
  - **foundation that allows Department of Defense (DoD) C2 capabilities to exploit the Global Information Grid (GIG) and minimize integration risks as capabilities are deployed**

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Joint C2 Architectural Drivers

- Align with the goals, principles, and rules of the DoD Information Enterprise Architecture (DIEA)
- Comply with DoD Net-Centric Data Strategy
- Maximize Use of Enterprise Infrastructure Services
  - All Infrastructure Services Must Federate as Appropriate to Provide a Single Logical Service
  - Community specific functional/data services available to the Enterprise
  - Only build Joint C2 infrastructure when necessary
- Provide capabilities to challenging user environments (DIL)
  - Disconnected operations
  - Intermittent connectivity
  - Limited communications
- Provide a scalable solution that meets operational requirements and key performance parameters and reduces technical risks

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Joint C2 Architecture Team

- Architecture created by the Architecture Core Team
- Team: technical members representing each Service
  - Army
  - Navy
  - Marines
  - Air Force
  - DISA
  - JFCOM
- Subject Matter Experts
  - Data
  - IA
  - REST
  - Technical Standards
    - Meet weekly, discuss technical issues, vote on issues, write docs

Members Write the Architecture Documents

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Joint C2 Architecture Views

- **Software View**
  - Describes software constructs (e.g., capability modules, services, and interfaces) and applicable software standards
- **Physical View**
  - Describes physical topology, deployment of software on hardware devices, and operational environment characteristics
- **Data View**
  - Describes data standards and guidance for complying with DoD Net-centric Data Strategy
- **Information Assurance View**
  - Describes information assurance strategy and security solutions
- **Technical Standards View**
  - Profile registered in DoD Information Technology Standards and Profile Registry (DISR)

Joint C2 Architecture: Software View

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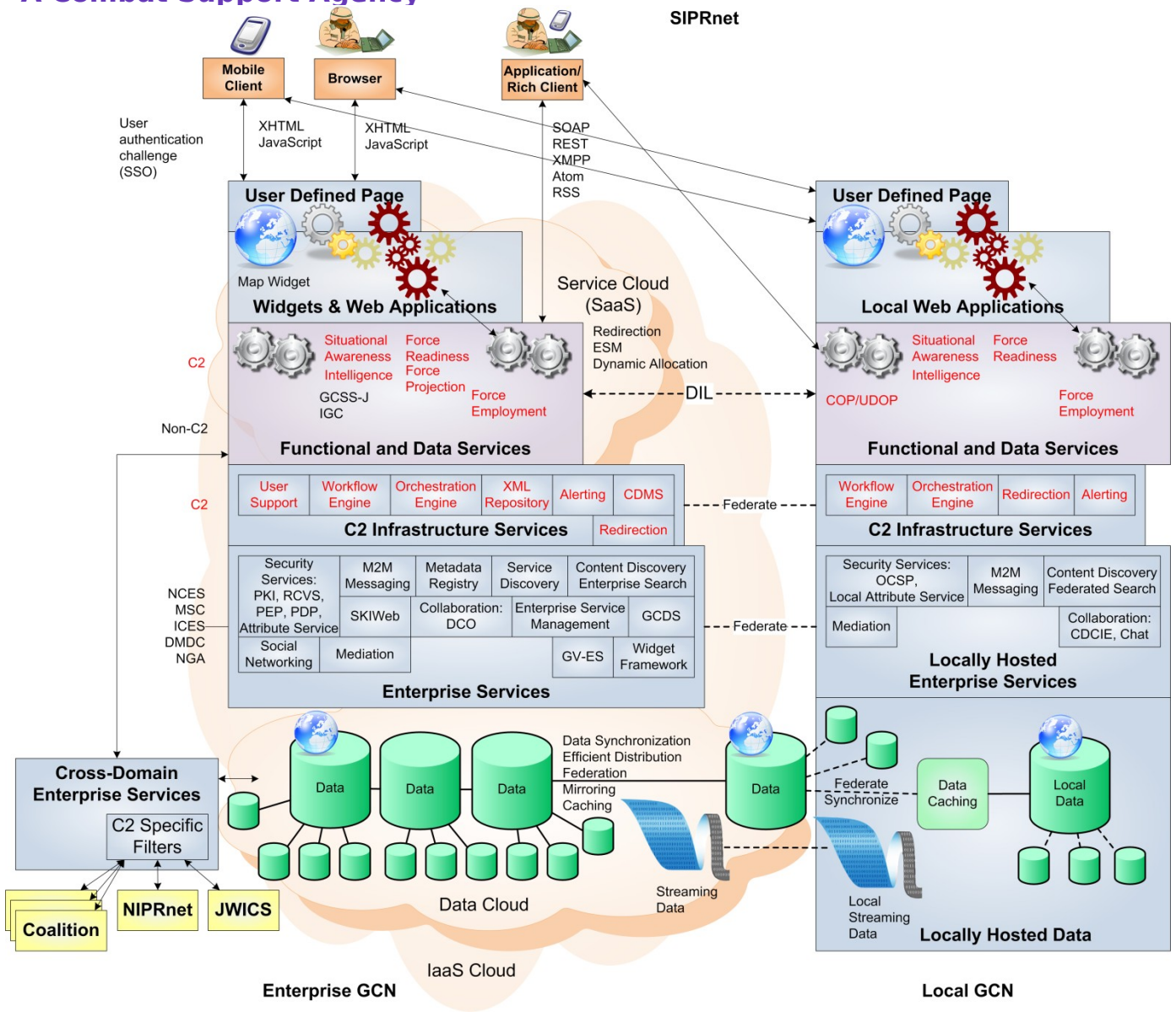

Acronyms

CDCIE = Cross Domain Collaborative Information Environment
CDES = Cross-Domain Enterprise Services
DIA = Defense Intelligence Agency
DIL = Disconnected Operations, Intermittent Connectivity, Limited Communications
DMDC = Defense Manpower Data Center
DoDIIS = Department of Defense Intelligence Information System
GCCS-J = Global Command and Control System - Joint
GCDS = GIG Content Delivery Service
GES = GIG Enterprise Services
GIG = Global Information Grid
GTN = Global Transportation Network
GV-ES = Geospatial Visualization -Enterprise Service
ICES = Intelligence Community Enterprise Services
IGC = IDE/GTN (Integrated Development Environment/Global Transportation Network) Convergence
MNIS = Multi-National Information Sharing
MSC = Multi-Service SOA Consortium
NCES = Net-Centric Enterprise Services
NGA = National Geospatial-Intelligence Agency
PDP = Policy Decision Point
PEP = Policy Enforcement Point
PKI = Public Key Infrastructure
RACE = Rapid Access Computing Environment (DISA)

Joint C2 Objective Architecture – Data View

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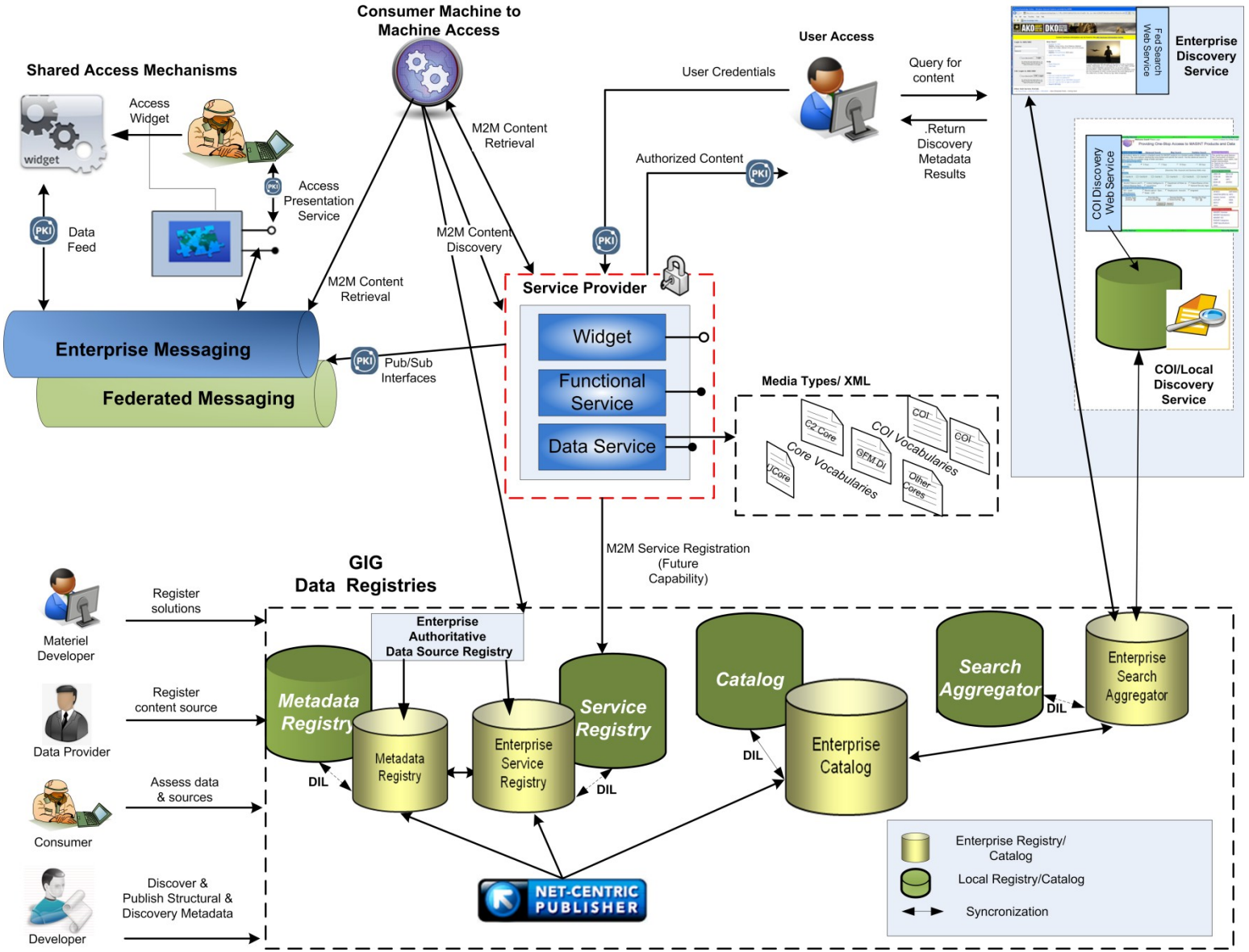

Joint C2 Objective Architecture – IA View

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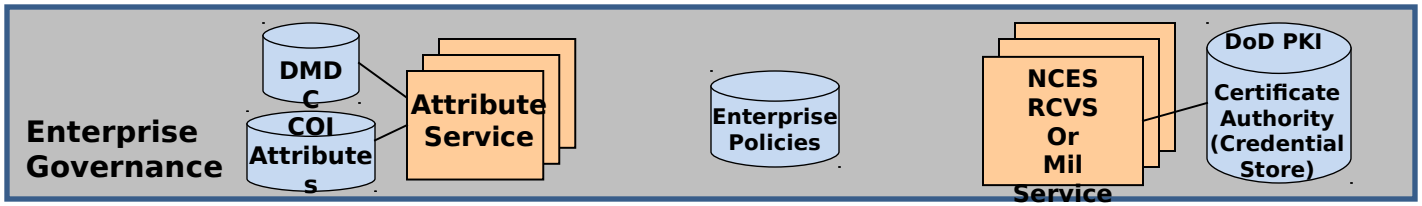
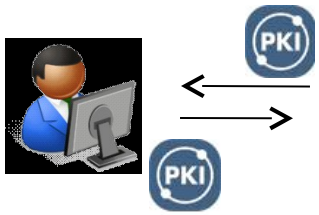


Enterprise Security Service Provider

Federated Identity to follow Enterprise User initiative

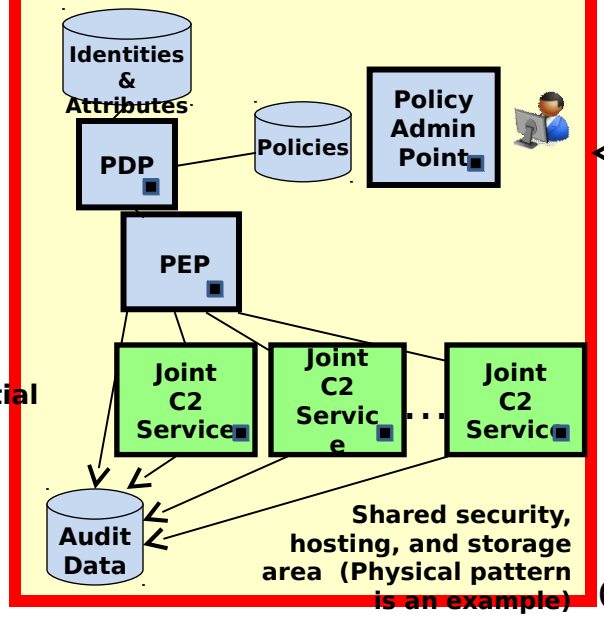
Authorization

Authentication

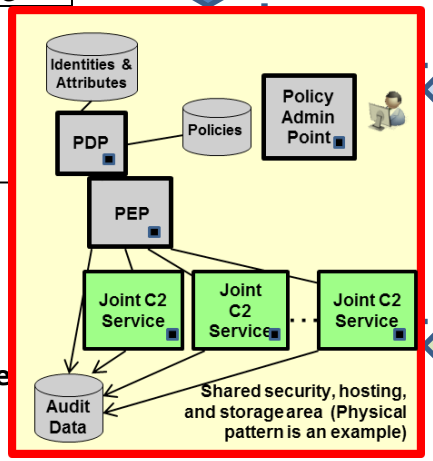


Or alternate credential mechanisms (e.g., Password)

Accountability / Audit, Non-repudiation



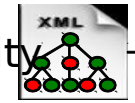
SOAP or RESTful transaction
- **Security controls based on risk assessment of service provider:**
  - **SSL/TLS**
  - **Digital signature, timestamp, message ID**
  - **Encryption of message or selected parts**
  - **SAML assertions**



Security Infrastructure Provider

Joint C2 Service Provider

Data Security Labeling/Tearline



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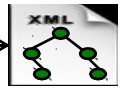
Cross Domain Enterprise Services



Releasable

Confidentiality/Integrity

- Need-to-know protection via Transport layer and/or message encryption
- SIPRNET encryption

Computer Network Defense

- HBSS :

AS = Attribute Service
HBSS = Host Based Security System
NCES = Net-Centric Enterprise Services
OCSP = Online Certificate Status Protocol
PDP = Policy Decision Point

PEP= Policy Enforcement Point
RCVS = Robust Certificate Validation Service
REST = Representational State Transfer
SAML = Security Assertion Markup Language

2 May 2011

UNCLASSIFIED

Joint C2 Architecture: Standards Profile

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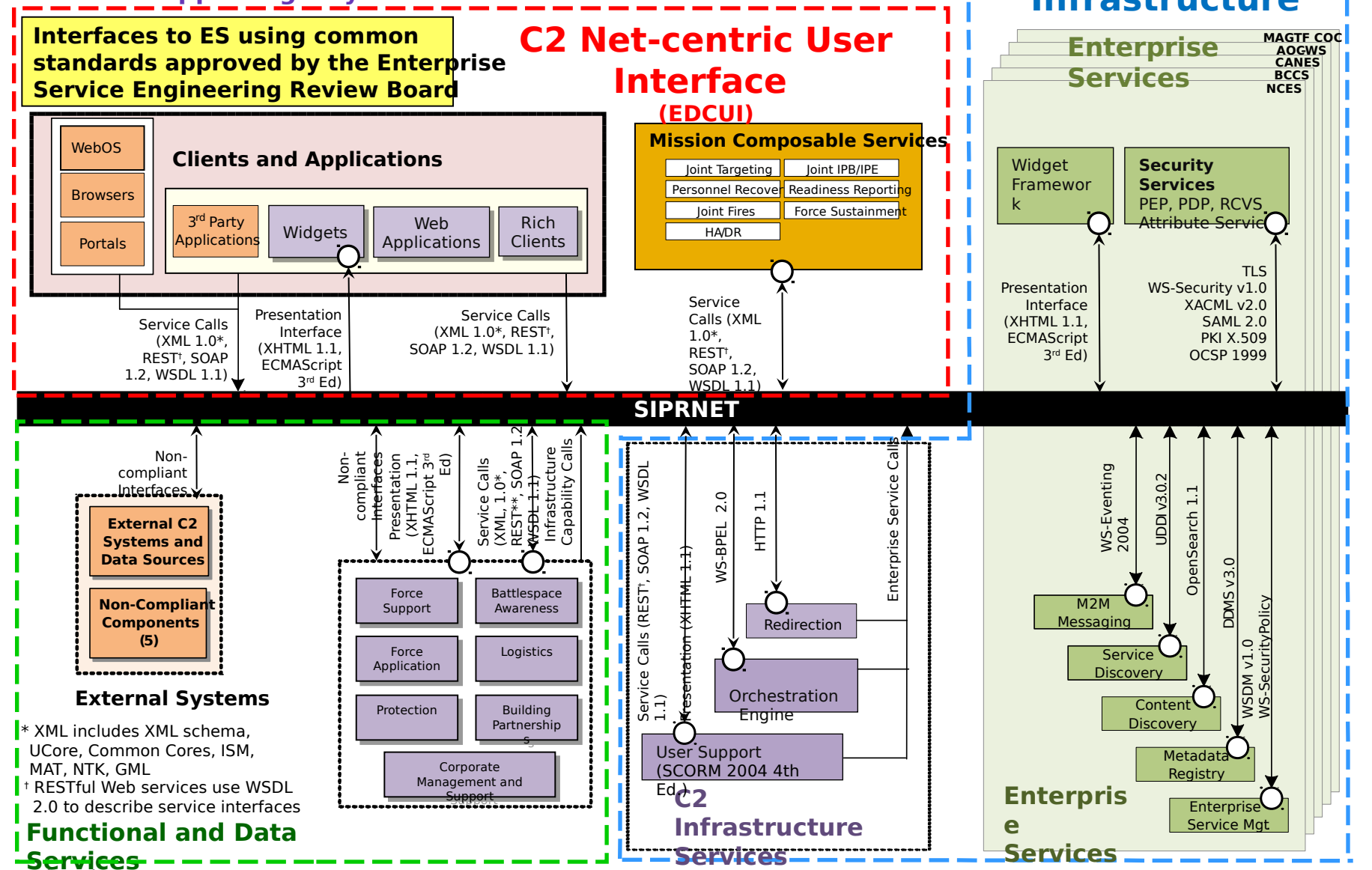

Updated: 2011.05.03

Evolving Joint C2 Architecture Efforts

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- **Expanded IA discussion**
  - Crypto Binding, REST security, IA for Widgets, audit controls
  - Cross Domain: info exchange including non-DoD partners
  - Security controls based on "DoD IC SOA Security Reference Architecture”
- **Further definition of information exchange patterns (UCORE & C2 CORE)**
- **Expanded discussion of Cloud Computing**
  - More alignment with NIST and cloud computing concepts and DISA CTO cloud vision
  - Further definition of Service Cloud
- **Further definition of Data Cloud including:**
  - Data synchronization, efficient distribution, caching, replication
  - Alignment with NIST cloud computing concepts
  - Data services provided by the infrastructure and service cloud
- **Expanded discussion of Widgets, including alignment with W3C**
- **Expanded discussion of Cross-Domain services**
- **Expanded discussion on tactical environments**
- **Working with C2 community and enterprise service providers (e.g. MSC) to define enterprise services from the edge**
  - End-to-end security services (e.g. Identity Management and Access Controls)
  - End-to-end federation of messaging services
  - Unified approach for mediation services (e.g. CDMS, TEDS JCTD)
  - Federated Collaboration
  - Widget frameworks

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Status & Way Ahead

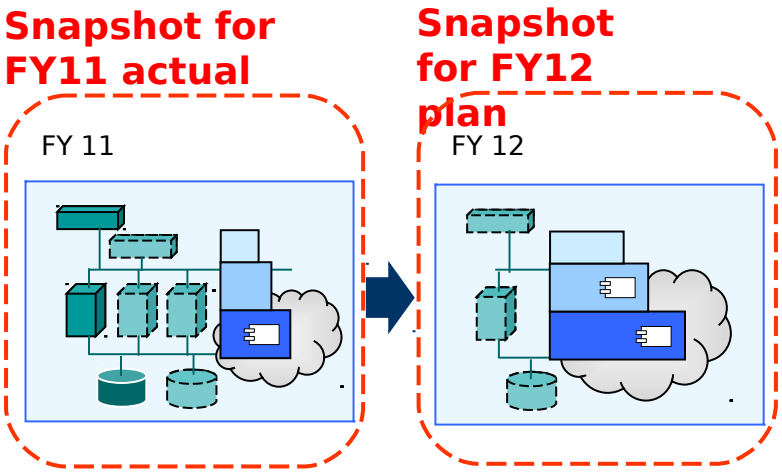
- **Joint C2 OA v2.0 docs & standards posted – 27 Oct 10**
  - 567 Comments Adjudicated – September 2010
- **Being adopted/used by**
  - DCGS-enterprise architecture
  - Army/Unmanned Aircraft System (UIS)
  - STRATCOM: ISPAN GAP CIE, NC2 Modernization
  - Other interest: JIEDDO, GFM-DI, NGA, ONR
- **Joint C2 Arch v2.1 – October 2011 target**
  - JSAP staffing for review/comment 3 Jun thru 5 Aug 2011
  - Comment adjudication & resolution 8 Aug thru 9 Sep 2011
  - Document update/finalization 5 Sep thru 30 Sep 2011
- **DoD CIO assessing it as a Reference Architecture**
- **Portions being identified as GIG Technical Profiles (GTPs)**

Other Architecture Activities

Transition Architecture (TA)

Focus on C2 community

An annual architectural depiction of the evolution toward the Joint C2 Objective Architecture for C2 capabilities approved by the Plan/Build Process & aligned with C2 Modernization Plan



Architecture Compliance Assessment

Focus on specific initiatives

An assessment of selected Joint C2 initiatives based on the architectural guidance and constraints specified in the Joint C2 Objective Architecture (Architecture Driven Requirements & Standards).

- The Architecture Compliance Guidance contains 36 compliance criteria

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Architecture Documents

- Joint C2 Objective Architecture: Framework, v. 2.1
- Joint C2 Objective Architecture: Software View, v. 2.1
- Joint C2 Objective Architecture: Physical View, v. 2.1
- Joint C2 Objective Architecture: Data View, v. 2.1
- Joint C2 Objective Architecture: Information Assurance View, v. 2.1
- Joint C2 Standards Profile, v. 2.1

- Supplemental documents
  - Joint C2 Architecture-Driven Requirements, v. 2.0
  - Joint C2 Objective Architecture: Migration Patterns, v. 2.0

- Available on DKO at: https://www.us.army.mil/suite/files/30184579

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